Philadelphia Water (PW) has been conducting lead sampling in high risk homes mandated under the Lead and Copper Rule (LCR) since 1992. Eleven rounds of in-home sampling for compliance with the LCR are summarized in the table below. During the first round of sampling in 1992, PW was above the action level for lead. In subsequent rounds Philadelphia met the lead action level. PW did not exceed the action limit for copper in any of the eleven rounds of sampling.

PW conducted corrosion control studies and implemented optimized corrosion control treatment using an orthophosphate based product in the mid 1990s. The sampling results for 1997 and thereafter represent conditions of optimized corrosion control. Currently, PW conducts lead sampling every three years during June-September period.

Lead and Copper Monitoring History

Year	Samples required	Homes sampled	Lead		Copper	
			90th Percentile	Action level	90th Percentile	Action level
Jan-Jun 1992	100	162	0.021 mg/L	0.015 mg/L	0.9 mg/L	1.3 mg/L
Jul-Dec 1992	100	143	0.015 mg/L		0.8 mg/L	
Jan-Jun 1997	100	118	0.014 mg/L		0.4 mg/L	
Jul-Dec 1997	100	108	0.011 mg/L		0.4 mg/L	
Jun-Sep 1998	50	79	0.010 mg/L		0.3 mg/L	
Jun-Sep 1999	50	59	0.009 mg/L		0.3 mg/L	
Jun-Sep 2002	50	63	0.013 mg/L		0.3 mg/L	
Jun-Sep 2005	50	107	0.010 mg/L		0.3 mg/L	
Jun-Sep 2008	50	97	0.006 mg/L		0.3 mg/L	
Jun-Sep 2011	50	92	0.006 mg/L		0.3 mg/L	
Jun-Sep 2014	50	134	0.005 mg/L		0.3 mg/L	

➢ Any and all information (including, but not limited to, lead service line maps, databases, addresses) that describe the location of lead service lines and lead service line replacements within the agency's coverage area. If there are no existing documents that reflect this, please provide any documents that would allow me to determine where lead service lines lie within the agency's coverage area.

PW customers own the entire service connection from the meter to the main. The Department does not have records of where the lead service lines (LSL) are or information on when homeowners repair or replace service connections. We obtain information about LSLs during recruitment efforts for LCR. We are providing maps that show distribution of LCR sampling sites in the city for all LCR rounds and separately for 2014 round.

➢ The complete results of the last five (5) cycles of Lead and Copper Rule monitoring/testing. This request includes, but is not limited to, the full address of each home tested, the tiering category of each home tested, the date of the sampling, the test results for each home and what if any lead component each home has.

In the following pages all results reported to the Pennsylvania Department of Environmental Protection PA DEP for 2002, 2005, 2008, 2011, & 2014. All samples were collected between June and September of the corresponding year. Each home tested includes information for Tier category and what type of lead component was found in the houses.. The full addresses were not included to protect the privacy of the volunteer participants.

➢ The complete results of any Lead and Copper Rule compliant samples or additional tests that have been invalidated, excluded and/or not included in the 90th percentile calculation from the last five (5) cycles of Lead and Copper Rule monitoring/testing.

All valid sampling results are included in 90^{th} percentile calculation to determine compliance with LCR action level.

Occasionally samples are invalidated if they do not meet EPA sampling guidelines or there are inconsistencies with the sampling protocol. For example, one sample was invalidated in the 2014 sampling round and below is a brief explanation for the invalidation.

> One of the customers in the sampling pool collected a sample in mid-June 2014 and did not contact us for a pick up for 30 days. The sample was analyzed for lead with the result of 6 ppb. The customer would not provide an explanation about storage conditions of the sample bottle once the sample was collected and we were concerned about custody of the sample between collection and pick up. One reason for invalidation was that the sample could have been tampered with or altered in some way during this time. The other reason was that all other samples that we were reporting for LCR have been started with the acidification step within 14

days of collection, as per method recommendation, but this sample arrived to the lab after a long holding time and the analysis was inconsistent with the other samples. The customer was supplied with a replacement bottle and the sample was re-collected. The replacement sample was analyzed with the result of 1 ppb and was reported to DEP along with all other samples for that round. Original sample had no bearing on compliance with LCR lead action level and was invalidated.

➢ The protocol given to test sample collectors and/or landlord/renters at homes tested or in other testing contexts for the last five (5) cycles of testing. If possible, include an image or description of the bottle provided to samplers to collect the water sample.

We ask our customers to do sampling in accordance with the Lead and Copper Rule requirements, which require a collection of a first draw cold water sample after a minimum of 6 hours of stagnation. Sampling is conducted from cold water taps where water is most commonly used (usually it is a kitchen tap) and we ask the participants not to use the water for at least 6 hours prior to sampling. Most homeowners choose to not use the water overnight or when they are out of the house for work and then get a first draw sample from a cold water tap in the provided sample bottles.

In the following pages is a copy of sampling instructions. The sample collection protocol provided to participants is listed at the end of the sample siting location plan (SSLP). Below are images of the bottles provided to customers for sampling: 1 Liter acid washed plastic sample bottle.

➢ Any and all description, document or protocol for how the agency determines the sampling pool from which homes are chosen to monitor compliance with the Lead and Copper Rule.

Criteria for selection of participants follow LCR classification for high risk homes. In Philadelphia, we recruit single family residences that are served by a lead service line or have copper pipes with lead solder installed prior to 1986, when Pennsylvania's lead ban went into effect. Recruitment is done in the areas where we will most likely find lead services, which is where the older homes are. In addition, in each round of triennial LCR sampling all previous participants are always contacted with the request to participate in lead sampling. In the last recruitment effort for 2014 sampling we identified areas of the city with clusters of older homes and sent out letters to a subset of these homes with a request to participate in the sampling program. We then conducted plumbing inspections for homeowners who responded to our request to make sure their homes meet the Tier requirements for LCR and have lead in their plumbing. Homes which met LCR tier criteria comprised our sampling pool.

➢ The Lead and Copper Rule report sent to the primary agency for the last five (5) cycles of testing.

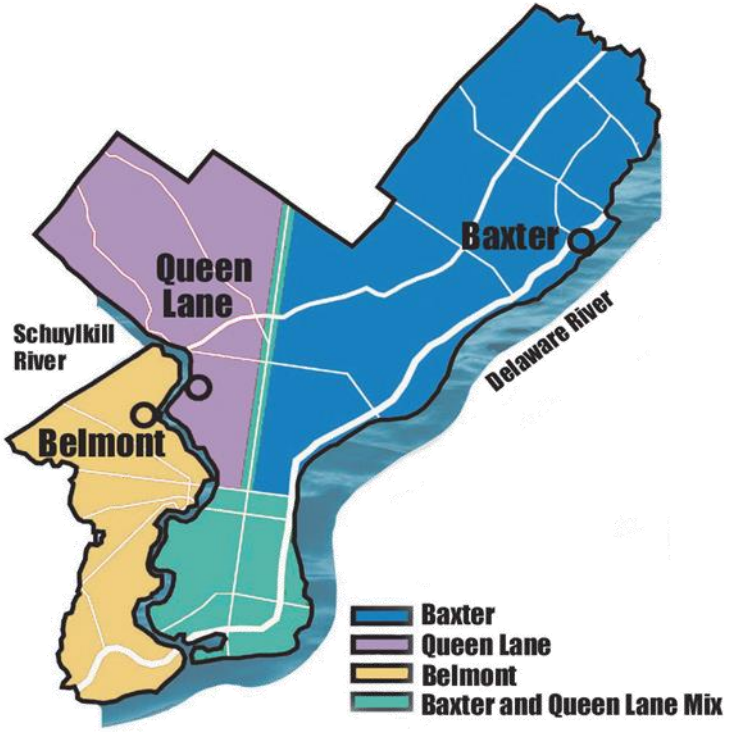
See following pages for the 2014 Sample Siting Plan submitted to the PA DEP for the 2014 sampling round. The names of individuals, internal PWD site information and addresses have been masked for privacy and security reasons.

Note that “SRA” is the Scientific and Regulatory Affairs group in the PW that oversees the compliance monitoring program.

Philadelphia Water System overview

November 2015

- **1,738,006 people served**
- **130 square mile area inside City**
- **3 Water Treatment Plants**
- **240 MG average daily water delivery**
- **13 Pressure Districts**
- **3,187 miles of water main**
- **91,957 valves**
- **25,364 hydrants**
- **472,553 water accounts**



***Note: "<" indicates that results were below detection limit and were reported to the PA DEP as "0"**

SFR>82: Single Family Residence with lead solder after 1982

SFR LSL: Single Family Residence with Lead Service Line

SFR<86: Single Family Residence with lead solder before 1986

ID	Tier	Critieria	Jun-Sep 02 (Pb)	Jun-Sep 02 (Cu)	Jun-Sep 05 (Pb)	Jun-Sep 05 (Cu)	Jun-Sep 08 (Pb)	Jun-Sep 08 (Cu)	Jun-Sep 11 (Pb)	Jun-Sep 11 (Cu)	Jun-Sep 14 (Pb)	Jun-Sep 14 (Cu)
4	1	SFR>82	<0.001	0.049	< 0.002	0.08	0.004	0.085				
5	1	SFR LSL	0.001	0.155	0.008	0.288	< 0.002	0.308	<0.001	0.234	0.001	0.299
7	1	SFR>82	0.005	0.216	0.009	0.228						
8	1	SFR LSL	0.005	0.295			< 0.002	0.299	<0.001	0.129	0.010	0.200
13	1	SFR>82			0.006	0.172						
18	1	SFR LSL	0.001	0.056	< 0.002	0.177						
19	1	SFR>82	0.001	0.136								
22	1	SFR LSL			0.003	0.161	0.003	0.196	0.002	0.164		
23	1	SFR LSL	0.008	0.098	0.046	0.16	0.002	0.119	0.003	0.223	0.122	0.224
25	1	SFR LSL	0.001	0.074								
28	1	SFR LSL	0.011	0.046								
30	1	SFR LSL	0.036	0.15			< 0.002	0.076	0.293	2.340		
34	1	SFR LSL	0.027	0.079	0.006	0.243			0.003	0.255	<0.001	0.099
35	1	SFR>82	0.003	0.13								
36	1	SFR>82	<0.001	0.059	< 0.002	0.097						
37	1	SFR>82			< 0.002	0.189						
48	1	SFR>82			0.003	0.042					<0.001	0.024
49	1	SFR LSL	0.109	0.174								
52	1	SFR>82					< 0.002	0.044				
53	1	SFR LSL	0.017	0.037								
54	1	SFR>82	<0.001	0.068	< 0.002	0.095					<0.001	0.052
55	1	SFR>82	0.001	0.152			< 0.002	0.194	0.001	0.195	0.002	0.166
60	1	SFR LSL	0.003	0.051								
64	1	SFR>82	<0.001	0.113								
65	1	SFR LSL	0.001	0.04			0.002	0.234	0.001	0.173	0.001	0.168
67	1	SFR>82	0.004	0.098								
76	1	SFR>82	0.001	0.22			< 0.002	0.319	<0.001	0.244	<0.001	0.240
77	1	SFR>82							<0.001	0.510	0.005	0.333
78	1	SFR>82	0.001	0.297								
81	1	SFR>82	<0.001	0.277								
86	1	SFR>82	0.001	0.093	0.039	0.35	< 0.002	0.104				
87	1	SFR>82	<0.001	0.167								
90	1	SFR>82	<0.001	0.073	< 0.002	0.092	< 0.002	0.112	<0.001	0.071		
91	1	SFR>82	<0.001	0.037								
97	1	SFR>82	0.006	0.07			< 0.002	0.077	0.001	0.088		
101	1	SFR>82	<0.001	0.33								
106	1	SFR LSL	0.004	0.016							0.001	0.106
110	1	SFR LSL	0.014	0.007								
111	1	SFR>82	<0.001	0.039					<0.001	0.228	0.001	0.225
112	1	SFR LSL					0.004	0.114	0.001	0.228		
113	1	SFR>82	0.001	0.187	0.005	0.237	0.004	0.275	<0.001	0.212	0.004	0.194
123	1	SFR LSL	0.001	0.062	0.004	0.042	< 0.002	0.093	<0.001	0.282	<0.001	0.102
126	1	SFR LSL	0.003	0.0126							<0.001	0.273
127	1	SFR LSL	0.003	0.079								
129	1	SFR LSL	0.002	0.245			0.002	0.054				
130	1	SFR LSL							0.003	0.254		
131	1	SFR LSL	0.006	0.084								
133	1	SFR LSL	<0.001	0.029					0.002	0.125		
139	1	SFR LSL	0.008	0.156	0.004	0.247						
142	1	SFR>82	0.005	0.18								
148	1	SFR>82	0.002	0.317					<0.001	0.208		
150	1	SFR>82	0.001	0.034							0.001	0.350
152	1	SFR>82	0.001	0.097								
153	1	SFR LSL	0.002	0.028	0.002	0.248	< 0.002	0.104	0.001	0.048	<0.001	0.057
155	1	SFR>82	0.004	0.298	< 0.002	0.345	< 0.002	0.374	0.001	0.317	<0.001	0.421
156	1	SFR LSL	0.093	0.288					0.001	0.108	0.002	0.209
158	1	SFR LSL	0.007	0.082								
159	1	SFR>82	0.002	0.11	< 0.002	0.219	< 0.002	0.167	0.003	0.251	0.002	0.204
160	1	SFR LSL	0.002	0.026								
162	1	SFR LSL	0.008	0.251	0.007	0.175	0.011	0.322	0.008	0.235	0.005	0.314
165	1	SFR LSL	0.002	0.074								
166	3	SFR<86	0.003	0.108								
167	3	SFR<86	<0.001	0.153								
168	1	SFR>82	<0.001	0.145								
169	3	SFR<86	0.029	0.121								
170	3	SFR<86	0.003	0.108								
171	3	SFR<86	0.001	0.06								
172	3	SFR<86	0.005	0.392								
173	3	SFR<86	<0.001	0.308								
174	3	SFR<86	0.005	0.143								
175	3	SFR<86	0.002	0.16	< 0.002	0.098	< 0.002	0.093	<0.001	0.171	<0.001	0.131
176	3	SFR<86			< 0.002	0.045	< 0.002	0.047	<0.001	0.035	<0.001	0.035
177	3	SFR<86			< 0.002	0.2	< 0.002	0.108				
178	3	SFR<86			< 0.002	0.097	< 0.002	0.286				
179	1	SFR LSL			0.002	0.149	0.004	0.168	0.001	0.051	0.002	0.071
180	1	SFR LSL			< 0.002	0.11	< 0.002	0.119	0.002	0.139		
181	3	SFR<86			< 0.002	0.099						
182	3	SFR<86			< 0.002	0.121	< 0.002	0.082	<0.001	0.107		
183	3	SFR<86			0.003	0.187	0.018	0.176	0.002	0.142	<0.001	0.133
184	3	SFR<86			< 0.002	0.076			<0.001	0.027	<0.001	0.048
185	3	SFR<86			< 0.002	0.043						
186	3	SFR<86			< 0.002	0.089			<0.001	0.116		
187	3	SFR<86			0.008	0.366	0.003	0.296				
188	3	SFR<86			< 0.002	0.146						
189	3	SFR<86			< 0.002	0.069						
190	3	SFR<86			< 0.002	0.079			<0.001	0.064	<0.001	0.076
191	3	SFR<86			< 0.002	0.124	< 0.002	0.097	<0.001	0.184		
192	3	SFR<86			0.002	0.051						
193	3	SFR<86			0.007	0.121	0.003	0.083	0.001	0.067		
194	3	SFR<86			< 0.002	0.23	< 0.002	0.109			0.002	0.241
195	3	SFR<86			< 0.002	0.129			0.001	0.208		
196	3	SFR<86			< 0.002	0.242	0.006	0.318	0.002	0.233	0.001	0.232

***Note: "<" indicates that results were below detection limit and were reported to the PA DEP as "0"**

SFR>82: Single Family Residence with lead solder after 1982

SFR LSL: Single Family Residence with Lead Service Line

SFR<86: Single Family Residence with lead solder before 1986

ID	Tier	Critieria	Jun-Sep 02 (Pb)	Jun-Sep 02 (Cu)	Jun-Sep 05 (Pb)	Jun-Sep 05 (Cu)	Jun-Sep 08 (Pb)	Jun-Sep 08 (Cu)	Jun-Sep 11 (Pb)	Jun-Sep 11 (Cu)	Jun-Sep 14 (Pb)	Jun-Sep 14 (Cu)
197	3	SFR<86			0.004	0.087	0.008	0.068	0.004	0.126	<0.001	0.029
198	3	SFR<86			< 0.002	0.151			<0.001	0.097		
199	3	SFR<86			0.034	0.368			<0.001	0.078	0.001	0.089
200	3	SFR<86			0.003	0.094						
201	3	SFR<86			< 0.002	0.017	< 0.002	0.198				
202	3	SFR<86					0.003	0.169	0.031	0.127		
203	3	SFR<86					< 0.002	0.092				
204	3	SFR<86			0.007	0.057						
205	3	SFR<86			0.012	0.106	0.002	0.154				
206	3	SFR<86			0.002	0.146						
207	3	SFR<86			< 0.002	0.213						
208	3	SFR<86			< 0.002	0.073						
209	3	SFR<86			< 0.002	0.031	0.004	0.104				
210	3	SFR<86			0.004	0.157	0.003	0.153				
211	3	SFR<86			< 0.002	0.084						
212	3	SFR<86			< 0.002	0.102	< 0.002	0.237	<0.001	0.233		
213	3	SFR<86			< 0.002	0.106	< 0.002	0.103	0.007	0.222		
214	3	SFR<86			0.003	0.09						
215	3	SFR<86			< 0.002	0.114			<0.001	0.233		
216	1	SFR LSL			0.005	0.156	0.007	0.185	0.007	0.251		
217	3	SFR<86			< 0.002	0.142						
218	1	SFR LSL			0.002	0.232	0.002	0.273	0.003	0.228		
219	3	SFR<86			0.003	0.172	0.002	0.186	0.009	0.202	0.003	0.148
220	3	SFR<86			0.023	0.231	< 0.002	0.194	<0.001	0.173	<0.001	0.160
221	3	SFR<86			0.108	0.508						
222	3	SFR<86			< 0.002	0.108						
223	3	SFR<86			0.01	0.192						
224	3	SFR<86			0.003	0.106	< 0.002	0.100	0.001	0.086		
225	3	SFR<86			< 0.002	0.226	0.003	0.296	<0.001	0.219		
226	3	SFR<86			< 0.002	0.142						
227	3	SFR<86			< 0.002	0.262	< 0.002	0.338				
228	3	SFR<86			0.003	0.124						
229	3	SFR<86			< 0.002	0.134			0.008	0.301	0.003	0.183
230	3	SFR<86			0.002	0.18						
231	3	SFR<86			< 0.002	0.076			0.002	0.124		
232	3	SFR<86			0.035	0.583	0.013	0.981	<0.001	0.211	0.015	0.655
233	3	SFR<86			< 0.002	0.099			<0.001	0.023		
234	1	SFR LSL			< 0.002	0.112			<0.001	0.121		
235	3	SFR<86			< 0.002	0.061	0.004	0.090	0.002	0.066		
236	1	SFR LSL			0.004	0.305	< 0.002	0.113	0.005	0.283	<0.001	0.221
237	3	SFR<86			< 0.002	0.063	0.002	0.099	0.001	0.098	0.033	0.144
238	3	SFR<86			0.004	0.189			<0.001	0.114	<0.001	0.077
239	3	SFR<86			0.005	0.083						
240	3	SFR<86			< 0.002	0.045						
241	3	SFR<86			0.368	0.313						
242	3	SFR<86			< 0.002	0.05						
243	3	SFR<86			< 0.002	0.038						
244	3	SFR<86			< 0.002	0.081	< 0.002	0.036			<0.001	0.105
245	3	SFR<86			< 0.002	0.198			<0.001	0.024		
246	3	SFR<86			< 0.002	0.129						
247	3	SFR<86			< 0.002	0.138						
248	3	SFR<86			< 0.002	0.186	< 0.002	0.129				
249	3	SFR<86			< 0.002	0.062	< 0.002	0.087	<0.001	0.159	<0.001	0.177
250	3	SFR<86			< 0.002	0.22			<0.001	0.265		
251	3	SFR<86			< 0.002	0.056						
252	3	SFR<86			< 0.002	0.523	< 0.002	0.495	0.002	0.563	<0.001	0.455
253	3	SFR<86			0.002	0.084						
254	1	SFR LSL			< 0.002	0.104			0.008	0.386	<0.001	0.162
255	3	SFR<86			< 0.002	0.14			<0.001	0.130	<0.001	0.161
256	3	SFR<86			0.054	0.216						
257	3	SFR<86			0.004	0.517						
258	3	SFR<86			< 0.002	0.072	< 0.002	0.086	<0.001	0.027	<0.001	0.057
259	3	SFR<86					< 0.002	0.379				
260	3	SFR<86					< 0.002	0.039				
261	3	SFR<86					< 0.002	0.200	<0.001	0.157	<0.001	0.164
262	3	SFR<86					0.007	0.178				
263	3	SFR<86					0.003	0.250	<0.001	0.084		
264	3	SFR<86					< 0.002	0.072	<0.001	0.086	<0.001	0.067
265	3	SFR<86					0.019	0.233			<0.001	0.218
266	3	SFR<86					< 0.002	0.098			<0.001	0.125
267	3	SFR<86					< 0.002	0.141				
268	3	SFR<86					< 0.002	0.195				
269	3	SFR<86					0.004	0.395			<0.001	0.145
270	3	SFR<86					0.005	0.076	<0.001	0.062	0.001	0.050
271	3	SFR<86					0.002	0.278				
272	1	SFR LSL			0.005	0.213						
273	1	SFR LSL			0.024	0.249						
274	1	SFR LSL			0.005	0.161						
275	1	SFR LSL			0.004	0.212						
276	3	SFR<86					< 0.002	0.220				
277	3	SFR<86									0.001	0.070
278	3	SFR<86									<0.001	0.252
279	1	SFR LSL					0.003	0.274			0.040	0.180
280	1	SFR LSL					< 0.002	0.131				
281	1	SFR LSL					0.003	0.053				
282	3	SFR<86									<0.001	0.137
283	1	SFR LSL					0.005	0.131			0.001	0.136
284	1	SFR LSL					< 0.002	0.288			<0.001	0.127
285	1	SFR LSL					< 0.002	0.266				
286	3	SFR<86					< 0.002	0.020				
287	1	SFR LSL					< 0.002	0.110				
288	1	SFR LSL					< 0.002	0.160				

***Note: "<" indicates that results were below detection limit and were reported to the PA DEP as "0"**

SFR>82: Single Family Residence with lead solder after 1982

SFR LSL: Single Family Residence with Lead Service Line

SFR<86: Single Family Residence with lead solder before 1986

ID	Tier	Critieria	Jun-Sep 02 (Pb)	Jun-Sep 02 (Cu)	Jun-Sep 05 (Pb)	Jun-Sep 05 (Cu)	Jun-Sep 08 (Pb)	Jun-Sep 08 (Cu)	Jun-Sep 11 (Pb)	Jun-Sep 11 (Cu)	Jun-Sep 14 (Pb)	Jun-Sep 14 (Cu)
289	1	SFR LSL					< 0.002	0.094				
290	1	SFR LSL					0.006	0.152	0.004	0.163	0.006	0.165
291	1	SFR LSL					0.026	0.117				
292	3	SFR<86					< 0.002	0.079				
293	3	SFR<86					< 0.002	0.149				
294	1	SFR LSL					< 0.002	0.077				
295	1	SFR LSL					< 0.002	0.124				
296	3	SFR<86					< 0.002	0.085				
297	3	SFR<86					< 0.002	0.075				
298	1	SFR LSL					< 0.002	0.271				
299	3	SFR<86					0.002	0.163				
300	1	SFR LSL					0.001	0.327				
301	1	SFR LSL					0.003	0.026				
302	1	SFR LSL					0.006	0.168				
303	3	SFR<86					< 0.002	0.091				
304	1	SFR LSL							0.009	0.443		
305	3	SFR<86							0.005	0.034		
306	3	SFR<86							<0.001	0.096		
307	3	SFR<86									0.002	0.094
308	1	SFR LSL									0.002	0.164
309	1	SFR LSL							<0.001	0.035	<0.001	0.030
310	3	SFR<86							<0.001	0.206		
311	1	SFR LSL							0.003	0.358		
312	3	SFR<86							<0.001	0.148		
313	3	SFR<86							0.001	0.034		
314	1	SFR LSL							0.002	0.113	0.001	0.094
315	3	SFR<86							<0.001	0.133		
316	3	SFR<86							<0.001	0.085		
317	3	SFR<86									<0.001	0.028
318	3	SFR<86							<0.001	0.093		
319	3	SFR<86							0.002	0.192	<0.001	0.154
320	1	SFR LSL							<0.001	0.021		
321	3	SFR<86							<0.001	0.146	<0.001	0.107
322	3	SFR<86							<0.001	0.123		
323	3	SFR<86							<0.001	0.114	<0.001	0.089
324	3	SFR<86							0.002	0.329		
325	3	SFR<86							<0.001	0.086		
326	3	SFR<86							<0.001	0.106		
327	3	SFR<86							0.006	0.237		
328	3	SFR<86									<0.001	0.352
329	3	SFR<86									<0.001	0.091
330	3	SFR<86									0.002	0.109
331	3	SFR<86									<0.001	0.181
332	3	SFR<86									0.001	0.108
333	3	SFR<86									<0.001	0.150
334	1	SFR LSL									0.002	0.250
335	3	SFR<86									<0.001	0.146
336	3	SFR<86									0.001	0.424
337	3	SFR<86									0.003	0.095
338	3	SFR<86									0.002	0.310
339	3	SFR<86									0.002	0.086
340	3	SFR<86									0.001	0.095
341	3	SFR<86									<0.001	0.093
342	3	SFR<86									0.003	0.183
343	3	SFR<86									<0.001	0.096
344	1	SFR LSL									0.003	0.155
345	3	SFR<86									<0.001	0.128
346	1	SFR LSL									<0.001	0.015
347	3	SFR<86									<0.001	0.174
348	1	SFR LSL									0.001	0.219
349	3	SFR<86									0.001	0.107
350	3	SFR<86									0.002	0.009
351	1	SFR LSL									<0.001	0.202
352	1	SFR LSL									<0.001	0.014
353	3	SFR<86									0.001	0.025
354	3	SFR<86									<0.001	0.052
355	3	SFR<86									0.003	0.351
356	3	SFR<86									<0.001	0.203
357	3	SFR<86									<0.001	0.320
358	1	SFR LSL									0.002	0.053
359	1	SFR LSL									0.002	0.213
360	3	SFR<86									<0.001	0.085
361	3	SFR<86									0.025	0.202
362	1	SFR LSL									<0.001	0.018
363	1	SFR LSL									<0.001	0.016
364	3	SFR<86									0.001	0.317
365	3	SFR<86									0.002	0.151
366	3	SFR<86									0.004	0.117
367	3	SFR<86									<0.001	0.059
368	3	SFR<86									<0.001	0.049
369	3	SFR<86									<0.001	0.059
370	3	SFR<86									<0.001	0.087
371	3	SFR<86									0.002	0.128
372	3	SFR<86									0.002	0.110
373	3	SFR<86									<0.001	0.323
374	1	SFR LSL									0.003	0.028
375	3	SFR<86									<0.001	0.016
376	3	SFR<86									<0.001	0.152
377	3	SFR<86									0.062	0.539
378	3	SFR<86									0.005	0.143
379	3	SFR<86									0.006	0.164
380	3	SFR<86									0.035	0.206

***Note: "<" indicates that results were below detection limit and were reported to the PA DEP as "0"**

SFR>82: Single Family Residence with lead solder after 1982

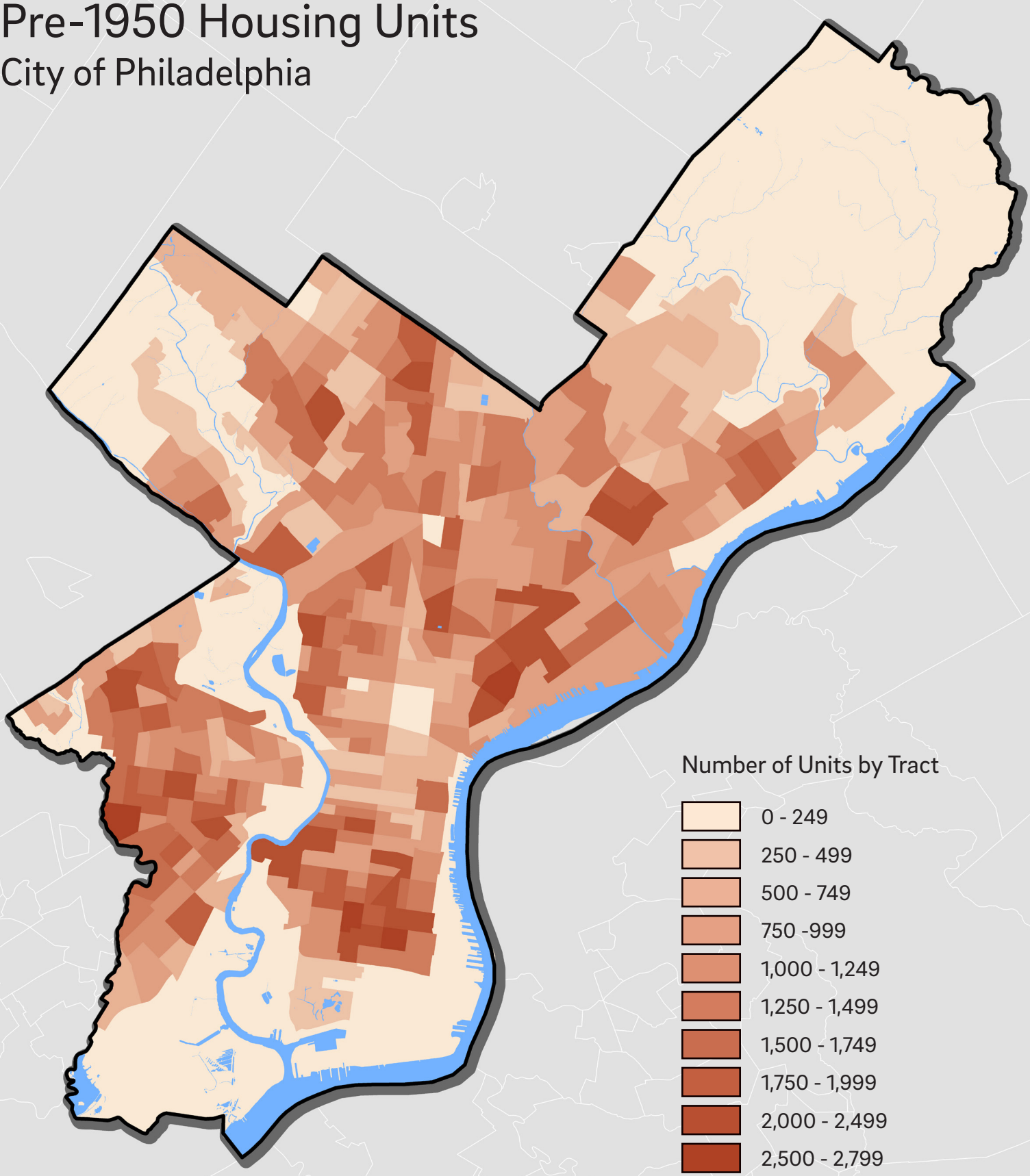
SFR LSL: Single Family Residence with Lead Service Line

SFR<86: Single Family Residence with lead solder before 1986

ID	Tier	Critieria	Jun-Sep 02 (Pb)	Jun-Sep 02 (Cu)	Jun-Sep 05 (Pb)	Jun-Sep 05 (Cu)	Jun-Sep 08 (Pb)	Jun-Sep 08 (Cu)	Jun-Sep 11 (Pb)	Jun-Sep 11 (Cu)	Jun-Sep 14 (Pb)	Jun-Sep 14 (Cu)
381	3	SFR<86									<0.001	0.122
382	3	SFR<86									0.001	0.128
383	3	SFR<86									0.002	0.146
384	1	SFR LSL									0.013	0.075
385	3	SFR<86									0.001	0.162
386	3	SFR<86									<0.001	0.072
387	3	SFR<86									<0.001	0.137
388	1	SFR LSL									0.001	0.076
389	3	SFR<86									<0.001	0.035
390	3	SFR<86									<0.001	0.089
391	3	SFR<86									0.019	0.161
392	3	SFR<86									<0.001	0.081
393	3	SFR<86									0.001	0.171
394	1	SFR LSL									0.003	0.234
395	3	SFR<86									<0.001	0.207
396	3	SFR<86									<0.001	0.123

Pre-1950 Housing Units

City of Philadelphia



*U.S. Census Bureau 2010

PHILADELPHIA WATER

M E M O R A N D U M

City of Philadelphia
Water Department

To: [redacted]

CC: [redacted]

From: [redacted]

Date: 10/3/2014

Re: 2014 - Sample Site Location Plan

Sample Site Location Plan

This document is the 2014 update of the Philadelphia Water Department's (PWD) Sample Site Location Plan (SSLP). This plan contains a summary of the execution and results of the 2014 round of the Lead and Copper Regulatory (LCR) sampling program. Specifically, this plan addresses changes in three key aspects of the LCR program: the LCR sampling locations, the water quality parameter sampling locations, and the LCR sampling procedure.

I. LCR Sampling Locations

Participant Enrollment

In the January preceding any LCR sampling period, an extensive effort is begun to recruit PWD's customers to participate in the upcoming program. The steps that we undertake to recruit an adequate and representative sampling pool consist of:

- Recruitment letters are sent to the addresses of all previous volunteers, including those originally sampled in 1992 at the outset of the program.
- PWD sends out a department wide email containing a notice about the program and the necessary contact information to all PWD employees.
- The new applicants and previous volunteers are asked to complete a survey of plumbing components and are being contacted by PWD staff to verify survey information and answer questions about the program.
- PWD conducts on-site material evaluations in homes of applicants. Each new applicant and previous participants who report changes to the plumbing components undergo a plumbing inspection at their home and have their plumbing materials checked for presence of lead.
- Homes which comply with LCR Tier 1 and Tier 3 selection criteria are enrolled in the sampling program.

In addition to normal recruitment efforts, an extensive outreach effort was implemented to increase participation of lead service line homes. An evaluation of home age records and internal records of distribution system main ages allowed PWD to select approximately 8,000 homes spread geographically around Philadelphia to contact for participation in the 2014 LCR sampling period. According to the real-estate data all homes were built before 1950 and had distribution mains laid before 1950. A letter was sent to each address noting the possibility of having a lead service line and asking to participate in the LCR sampling.

In total 8, 340 people, consisting of past participants and applicants, were contacted directly by SRA to participate in the 2014 round of LCR sampling; Table 1 notes some significant numbers regarding the recruitment effort. In addition to

this effort, a department wide email was sent out in the commissioner's name asking PWD employees to sign up for the program. In the end, only 334 people applied to participate in the sampling program. Though this isn't noted in the Table 1, 112 of the 334 applicants had participated in past years; in total our efforts garnered 222 new applicants. Of those 222 new applicants, only 68 ended up collecting a sample.

Table 1. Recruitment Effort and Final Participant Numbers

Total Participants Contacted	**8,340**
Total Applicants for 2014	**334**
Total Home Plumbing Inspections	**148**
Previous Applicants	23
New Applicants	125
Ready to Sample Total	**192**
Ready with Lead Service Lines	43
Ready with Lead Solder	149
Samples Returned Total	**134**
Returned with Lead Service Line	34
Returned with Lead Solder	100

Such a comprehensive effort to build the sample pool is undertaken due to problems retaining participants in the program year after year. It has proven impossible to retain all of the original 1992 participants, as they have dropped out due to three main reasons: low lead results, the inconvenience of sampling, and moving. Consistent low lead results, or even 1 instance of a low lead level, will often soothe, whether correctly or incorrectly, a customer's concerns over possible high lead levels in their water. We have seen this occur often, as participants who have been in 1, 2, or 3 rounds and have consistently received results with low lead level have decided there is no need to participate again as their water has been show to be safe. This occurrence, added to the complicated nature of collecting an LCR sample, and the chance that someone has moved since 1992, led to only 26 of our 1992 locations returning for the 2014 sampling round. All of the 2014 participants, along with all previous participants, are listed in Table 4 at the end of this document.

Sample Site Tiers

The tiers for each LCR sampling site are also listed in Table 4. However, Table 2 below lists the breakdown by Tier.

Table 2. Tier breakdown of 2011 LCR sampling locations

Tiers	Count	Criteria
1	42	LSL: 34 SFR - Pb Solder - 82-86: 8
2	0	NA
3	92	SFR - Pb Solder - Age: ?

Despite PWD's best efforts, it has been impossible to retain past sampling sites with lead service lines and enroll enough new lead service line sampling sites to make up for each year's loss. This occurrence, combined with our growing inability to determine whether lead solder was installed between 1982 and 1986 (as this was over 26 years ago, and many home owners aren't sure or are too new to know), has lead to the current balance in tiers among our sampling locations. Maps of all sampling locations in 2014 and 1992 – 2014 with Pressure Districts and Water Treatment Plant Service Areas can be found at the end of the SSLP.

2014 LCR Results

The 90th percentile of results for Lead in 2014 was 0.005 ppm and Copper was 0.3 ppm. See graph on page 8 for a full range of lead results since 1992. Of note is the percentage of results below 0.006 ppm for lead has increased each round with 2014 having the highest percentage of 91%.

II. Water Quality Parameters – Entry Point and Distribution Sites

Entry Points

The entry point locations are currently being sampled once every week for orthophosphate and on weekdays for pH (109.1103(c)(2)(iii)(B) required sampling frequency is every two weeks). PWD is using an approved orthophosphate-based corrosion inhibitor in achieving our Optimized Corrosion Control Treatment ('OCCT') at levels specified in the OCCT permit. The three entry point locations are listed in the Table 3 below:

Table 3. Entry Point Water Quality Parameter locations

Plant	Entry Point Location	PWD Loc-ID	PADEP Loc-ID
Baxter	High Service	[redacted]	101
Queen Lane	High Service	[redacted]	103
Belmont	High Service	[redacted]	102

Distribution System Locations

Under reduced water quality parameter monitoring PWD is required to sample 10 distribution sites twice in a 6-month period; however PWD has chosen to sample 12 sites every quarter. We refer to these 12 locations as our OCCT sites. OCCT sites were chosen to be representative of the three WTP service areas. At each OCCT site, the parameters that are tested for include: pH, Alkalinity, and Orthophosphate, Zinc, and Silica. The 12 locations that are currently sampled are listed below; the locations have not changed since the beginning of water quality parameter monitoring.

The sites are:

[redacted]

A map of the entry points and distribution system OCCT locations can be found at the end of the SSLP.

III. Sample Procedure Certification

The sampling procedure used in the 2014 LCR Program meets the sample collection methods that are identified in 109.1103(h)(1). The requirements for LCR sampling procedures that specifically affect the sampling instructions we provide our customers are identified below. It is not a comprehensive listing of all requirements under 109.1103(h)(1), just those that affect the instructions we provide to the customer.

i. Each first-draw tap sample for lead and copper shall be 1 liter in volume and have stood motionless in the plumbing system of each sampling site for at least 6 hours.

ii. First-draw samples from residential housing shall be collected from the cold water kitchen tap or bathroom sink tap. First-draw samples from a nonresidential building shall be collected at an interior tap from which water is typically drawn for drinking.

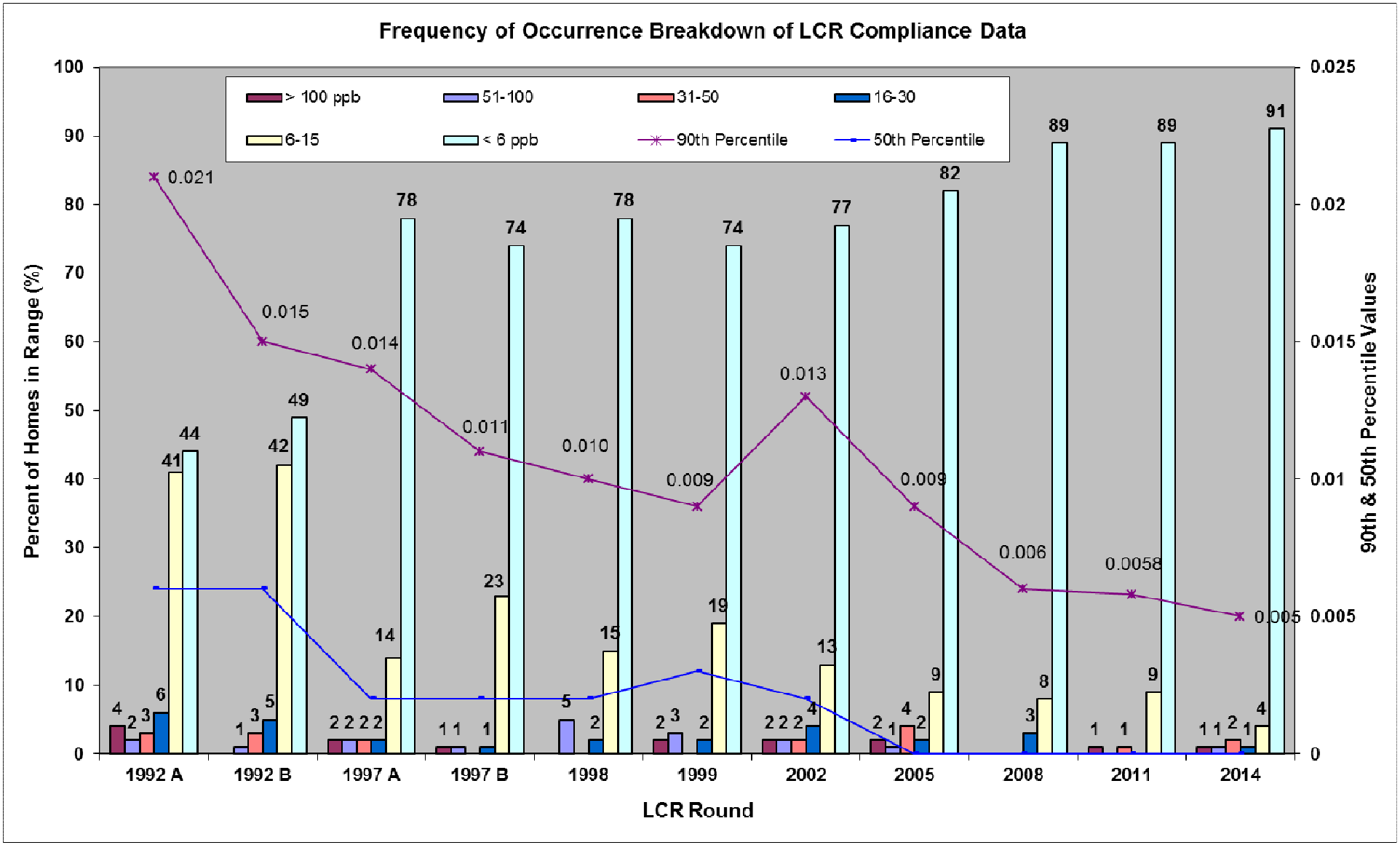
PWD's LCR sampling procedures meet these requirements, and the others found under 109.1103(h)(1). A copy of the sampling instructions and the Chain-of-Custody that were provided to each customer as part of the sampling can de found at the end of the SSLP.

Table 4. List of 2014 LCR Sampling Locations

ID	Address	Location Tier	Criteria
4	[redacted]	Tier 1 SFR	LSL
5	[redacted]	Tier 1 SFR	LSL
7	[redacted]	Tier 1 SFR	LSL
8	[redacted]	Tier 1 SFR	LSL
13	[redacted]	Tier 3 SFR	Pb Solder
18	[redacted]	Tier 1 SFR	Pb Solder - 83-86
19	[redacted]	Tier 1 SFR	Pb Solder - 83-86
22	[redacted]	Tier 1 SFR	LSL
23	[redacted]	Tier 1 SFR	Pb Solder - 83-86
25	[redacted]	Tier 1 SFR	Pb Solder - 83-86
28	[redacted]	Tier 1 SFR	LSL
30	[redacted]	Tier 1 SFR	Pb Solder - 83-86
34	[redacted]	Tier 1 SFR	Pb Solder - 83-86
35	[redacted]	Tier 1 SFR	LSL
36	[redacted]	Tier 3 SFR	Pb Solder
37	[redacted]	Tier 3 SFR	Pb Solder
48	[redacted]	Tier 1 SFR	LSL
49	[redacted]	Tier 1 SFR	Pb Solder - 83-86
52	[redacted]	Tier 1 SFR	LSL
53	[redacted]	Tier 1 SFR	Pb Solder - 83-86
54	[redacted]	Tier 1 SFR	LSL
55	[redacted]	Tier 3 SFR	Pb Solder
60	[redacted]	Tier 3 SFR	Pb Solder
64	[redacted]	Tier 1 SFR	LSL
65	[redacted]	Tier 3 SFR	Pb Solder
67	[redacted]	Tier 3 SFR	Pb Solder
76	[redacted]	Tier 3 SFR	Pb Solder
77	[redacted]	Tier 3 SFR	Pb Solder
78	[redacted]	Tier 3 SFR	Pb Solder
81	[redacted]	Tier 3 SFR	Pb Solder
86	[redacted]	Tier 3 SFR	Pb Solder
87	[redacted]	Tier 3 SFR	Pb Solder
90	[redacted]	Tier 3 SFR	Pb Solder
91	[redacted]	Tier 3 SFR	Pb Solder
97	[redacted]	Tier 3 SFR	Pb Solder
101	[redacted]	Tier 1 SFR	LSL
106	[redacted]	Tier 3 SFR	Pb Solder
110	[redacted]	Tier 3 SFR	Pb Solder
111	[redacted]	Tier 3 SFR	Pb Solder
112	[redacted]	Tier 3 SFR	Pb Solder
113	[redacted]	Tier 3 SFR	Pb Solder
123	[redacted]	Tier 1 SFR	LSL
126	[redacted]	Tier 3 SFR	Pb Solder
127	[redacted]	Tier 3 SFR	Pb Solder
129	[redacted]	Tier 3 SFR	Pb Solder

130	[redacted]	Tier 3 SFR	Pb Solder
131	[redacted]	Tier 3 SFR	Pb Solder
133	[redacted]	Tier 3 SFR	Pb Solder
139	[redacted]	Tier 3 SFR	Pb Solder
142	[redacted]	Tier 3 SFR	Pb Solder
148	[redacted]	Tier 3 SFR	Pb Solder
150	[redacted]	Tier 3 SFR	Pb Solder
152	[redacted]	Tier 1 SFR	LSL
153	[redacted]	Tier 3 SFR	Pb Solder
155	[redacted]	Tier 1 SFR	LSL
156	[redacted]	Tier 1 SFR	LSL
158	[redacted]	Tier 1 SFR	PLSL
159	[redacted]	Tier 3 SFR	Pb Solder
160	[redacted]	Tier 1 SFR	LSL
162	[redacted]	Tier 1 SFR	PLSL
165	[redacted]	Tier 1 SFR	LSL
166	[redacted]	Tier 3 SFR	Pb Solder
167	[redacted]	Tier 3 SFR	Pb Solder
168	[redacted]	Tier 3 SFR	Pb Solder
169	[redacted]	Tier 3 SFR	Pb Solder
170	[redacted]	Tier 3 SFR	Pb Solder
171	[redacted]	Tier 3 SFR	Pb Solder
172	[redacted]	Tier 3 SFR	Pb Solder
173	[redacted]	Tier 3 SFR	Pb Solder
174	[redacted]	Tier 3 SFR	Pb Solder
175	[redacted]	Tier 3 SFR	Pb Solder
176	[redacted]	Tier 1 SFR	LSL
177	[redacted]	Tier 3 SFR	Pb Solder
178	[redacted]	Tier 3 SFR	Pb Solder
179	[redacted]	Tier 3 SFR	Pb Solder
180	[redacted]	Tier 3 SFR	Pb Solder
181	[redacted]	Tier 3 SFR	Pb Solder
182	[redacted]	Tier 3 SFR	Pb Solder
183	[redacted]	Tier 3 SFR	Pb Solder
184	[redacted]	Tier 3 SFR	Pb Solder
185	[redacted]	Tier 3 SFR	Pb Solder
186	[redacted]	Tier 1 SFR	LSL
187	[redacted]	Tier 3 SFR	Pb Solder
188	[redacted]	Tier 1 SFR	LSL
189	[redacted]	Tier 3 SFR	Pb Solder
190	[redacted]	Tier 1 SFR	LSL
191	[redacted]	Tier 3 SFR	Pb Solder
192	[redacted]	Tier 3 SFR	Pb Solder
193	[redacted]	Tier 1 SFR	LSL
194	[redacted]	Tier 1 SFR	LSL
195	[redacted]	Tier 3 SFR	Pb Solder
196	[redacted]	Tier 3 SFR	Pb Solder
197	[redacted]	Tier 3 SFR	Pb Solder

198	[redacted]	Tier 3 SFR	Pb Solder
199	[redacted]	Tier 3 SFR	Pb Solder
200	[redacted]	Tier 1 SFR	LSL
201	[redacted]	Tier 1 SFR	LSL
202	[redacted]	Tier 3 SFR	Pb Solder
203	[redacted]	Tier 3 SFR	Pb Solder
204	[redacted]	Tier 1 SFR	LSL
205	[redacted]	Tier 1 SFR	LSL
206	[redacted]	Tier 3 SFR	Pb Solder
207	[redacted]	Tier 3 SFR	Pb Solder
208	[redacted]	Tier 3 SFR	Pb Solder
209	[redacted]	Tier 3 SFR	Pb Solder
210	[redacted]	Tier 3 SFR	Pb Solder
211	[redacted]	Tier 3 SFR	Pb Solder
212	[redacted]	Tier 3 SFR	Pb Solder
213	[redacted]	Tier 3 SFR	Pb Solder
214	[redacted]	Tier 3 SFR	Pb Solder
215	[redacted]	Tier 3 SFR	Pb Solder
216	[redacted]	Tier 1 SFR	LSL
217	[redacted]	Tier 3 SFR	Pb Solder
218	[redacted]	Tier 3 SFR	Pb Solder
219	[redacted]	Tier 3 SFR	Pb Solder
220	[redacted]	Tier 3 SFR	Pb Solder
221	[redacted]	Tier 3 SFR	Pb Solder
222	[redacted]	Tier 3 SFR	Pb Solder
223	[redacted]	Tier 3 SFR	Pb Solder
224	[redacted]	Tier 3 SFR	Pb Solder
225	[redacted]	Tier 3 SFR	Pb Solder
226	[redacted]	Tier 1 SFR	LSL
227	[redacted]	Tier 3 SFR	Pb Solder
228	[redacted]	Tier 3 SFR	Pb Solder
229	[redacted]	Tier 3 SFR	Pb Solder
230	[redacted]	Tier 1 SFR	LSL
231	[redacted]	Tier 3 SFR	Pb Solder
232	[redacted]	Tier 3 SFR	Pb Solder
233	[redacted]	Tier 3 SFR	Pb Solder
234	[redacted]	Tier 3 SFR	Pb Solder
235	[redacted]	Tier 3 SFR	Pb Solder
236	[redacted]	Tier 1 SFR	LSL
237	[redacted]	Tier 3 SFR	Pb Solder
238	[redacted]	Tier 3 SFR	Pb Solder


Frequency of Occurrence Breakdown of LCR Compliance Data
> 100 ppb
51-100
31-50
16-30
6-15
< 6 ppb
90th Percentile
50th Percentile
Percent of Homes in Range (%)
90th & 50th Percentile Values
LCR Round
1992 A
1992 B
1997 A
1997 B
1998
1999
2002
2005
2008
2011
2014
0.021
0.015
0.014
0.011
0.010
0.009
0.013
0.009
0.006
0.0058
0.005

Water Sampling Instructions

A. 6 or more hours BEFORE the water sampling:

1. **Disconnect any faucet attachments** (e.g. ice maker, water filter...) and **isolate any leaks** in the house.

2. **Remove the aerator** from the faucet. Leave the aerator off until sampling is completed.

3. Run only the cold water for **2 minutes**. **Cold water** should be the last water run through this faucet before the 6 or more hours stagnation period.

4. Turn the faucet off and **do not run water anywhere in your house until after the sample has been taken.** Do not run the dishwasher or clothes washer, use hot water, take a bath or flush toilets.

5. Make a note of the time on the **Chain of Custody Form**.

B. How to collect the water sample:

1. First, **at least 6 hours** must have passed since you stopped using water before collecting the sample. If cold or hot water was used by accident after you stopped using water, you can reschedule the sample collection to another day.

2. If everything is OK then proceed with sample collection. **Write on the label on the bottle**: your **Loc ID and the Date and Time** of sample collection.

3. Carefully uncap the bottle and keep the cap clean.

4. Slowly fill the bottle with only cold water to the **RED mark** on the neck of the bottle.

5. Turn off the faucet.

6. Replace the bottle's cap and tighten.

7. Replace the aerator on your faucet.

8. Fill out the **Chain-of-Custody Form**. **If you have any questions please call 215-685-1406.**

9. Place the sample bottle in the box, along with the completed **Chain-of-Custody Form** and set it outside of your front door in a place where we can pick it up without bothering you.

C. Call for sample pick-up:

1. When you call for pick-up, please let us know the **ID number** that is located on the label on the sample box, **your name**, **address** and a **contact number** where we can reach you. The sample will be picked up from the front door on the day of your call or the following business day.

2. **For pick-up call 215-685-1400. If no one picks up call 215-685-1406 and leave a message.**

Philadelphia Water Department
Lead and Copper Rule
Chain of Custody Form

Please Print

***Circle One*:** Ms. Mr. Mrs.

First Name:_____ ***Last Name:*** _____

Address:_____

1. **Have you made any recent plumbing changes in your home?** ( ) Yes ( ) No

   If ***Yes***, please **describe:** _____

   When? M*onth*_____ *Year* _____

2. **Do you have any leaks in your house? (Faucets, toilets, etc)?** ( ) Yes ( ) No

   a) Was the leak isolated with a shut-off valve before collecting the sample? ( ) Yes ( ) No

3. Our records indicate that the **Kitchen Sink** is designated as your sampling tap.

   Circle faucet used for sample collection: Kitchen Bathroom

   Was the aerator removed from the faucet during entire sampling process? ( ) Yes ( ) No

4. **Do you use any water treatment systems or devices at this sample location?** ( ) Yes ( ) No
   a) Please check if you have:
      ( ) a water softener
      ( ) an ice-maker
      ( ) a filter at the tap where you collected the sample
      ( ) an in-line filter for the whole house
   b) **Was the device bypassed or disconnected before collecting the sample?** ( ) Yes ( ) No

Additional Comments:_____

COMPLETE AT TIME OF SAMPLING

Before sampling, when was the water used last? Date ____/____/_____ Time _____ AM/PM
(No tap should have been opened or toilet flushed **since the pre-stagnation 2 minute flush explained in the directions**.)

Sample collected by_____ Date ____/____/_____ Time _____ AM/PM

Date Last Updated: 6/2/2014 Updated By: [redacted]

PWD USE ONLY

LOC ID_____ CHECKED_____ LIMS #_____

Released by	Date	Time	Received by	Date	Time
[redacted]					

Sample Analysis Information

Sample Acidification: Date ____/____/_____ Time _____ AM/PM

Sample pH check: Date ____/____/_____ Time _____ AM/PM

Sample pH < 2 pH: *(circle one)* YES / NO

Following verification that pH < 2, sample is analyzed for turbidity.

Sample turbidity: _____ NTU *(if turbidity is > 1 NTU, sample must be digested)*

Is sample digestion required? *(circle one)* YES / NO

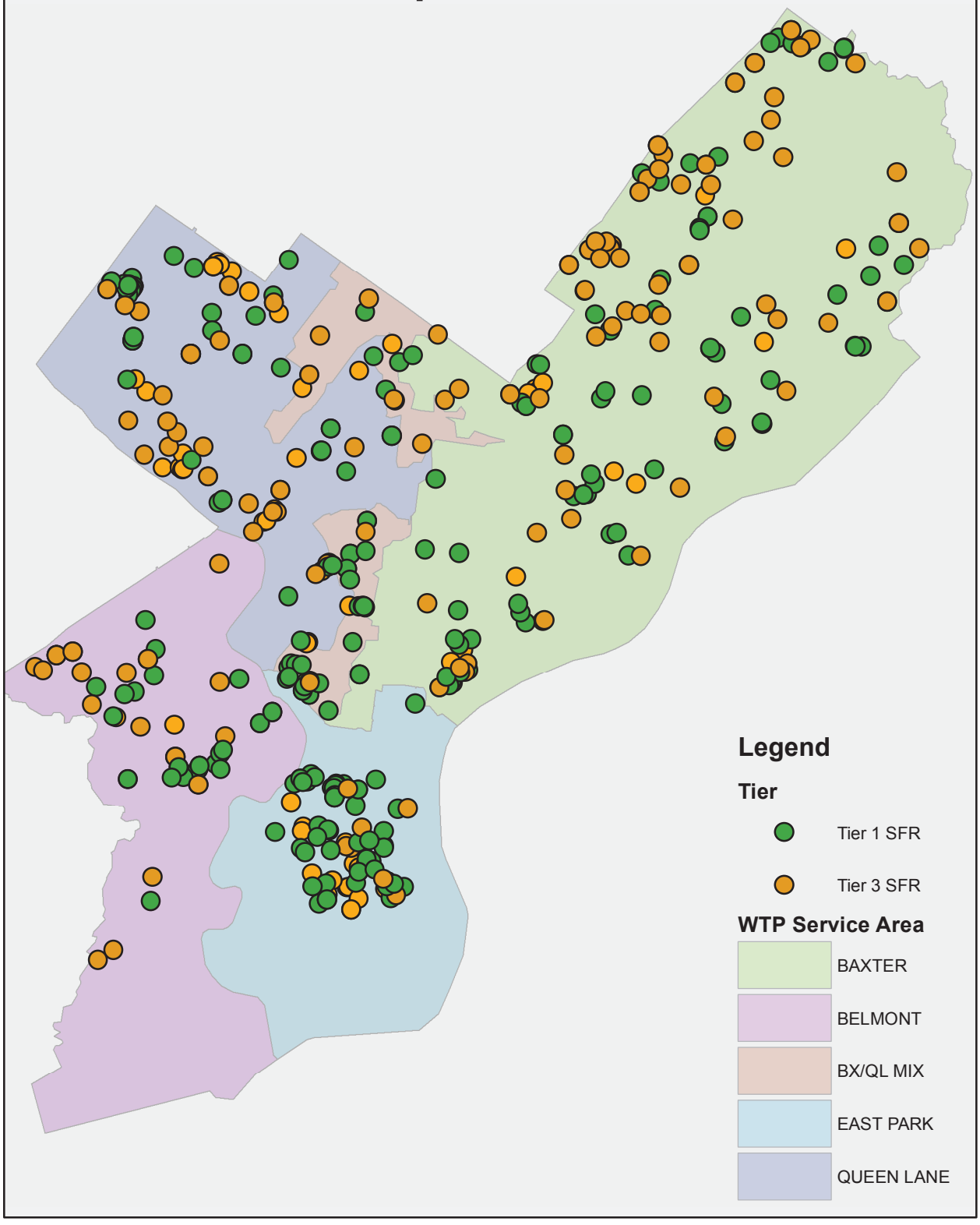
Quality Control records for all steps in the laboratory handling and analysis of samples are maintained in the Metals Laboratory.

Comments:

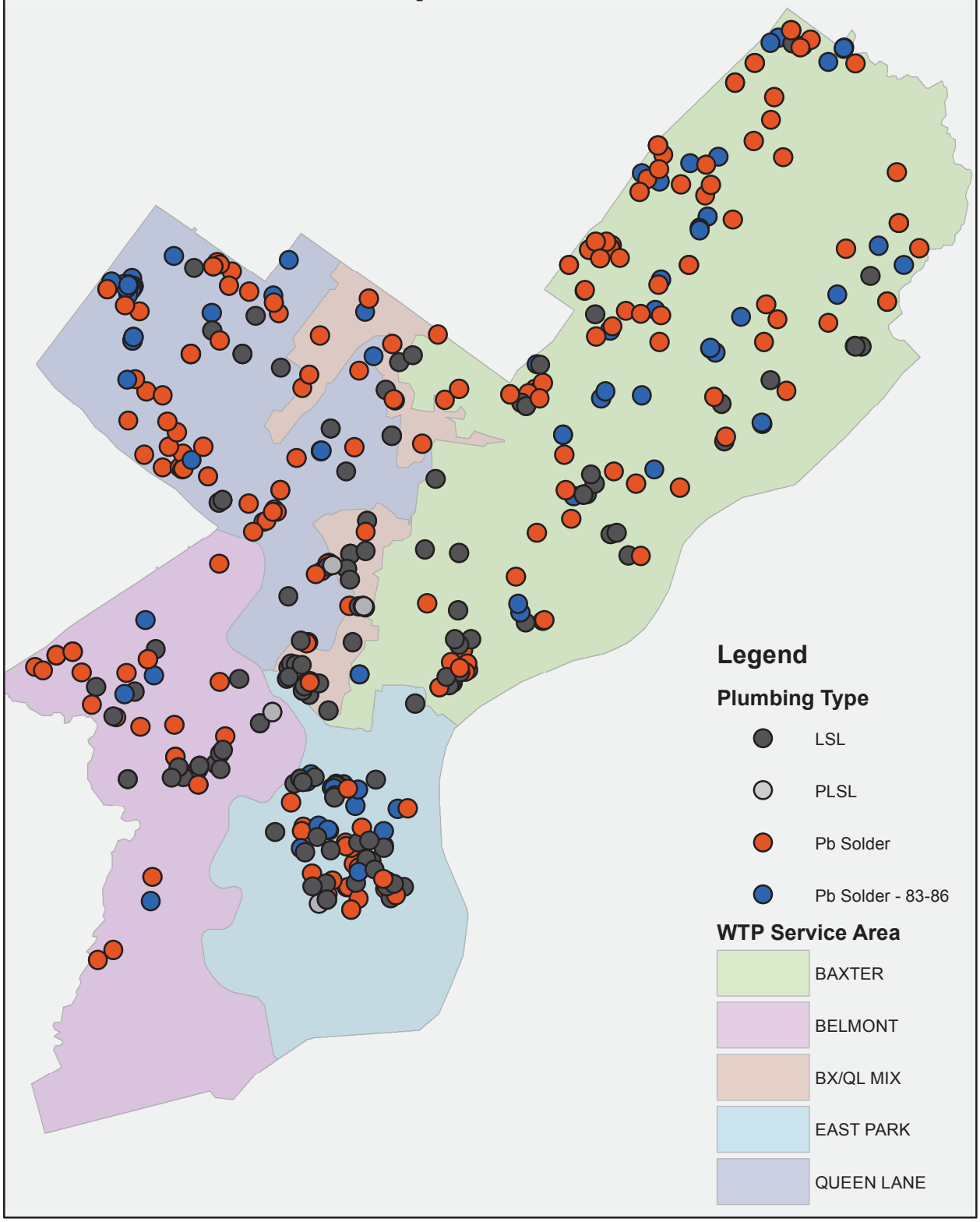
PWD USE ONLY

Date Last Updated: 6/2/2014 Updated By: [redacted]

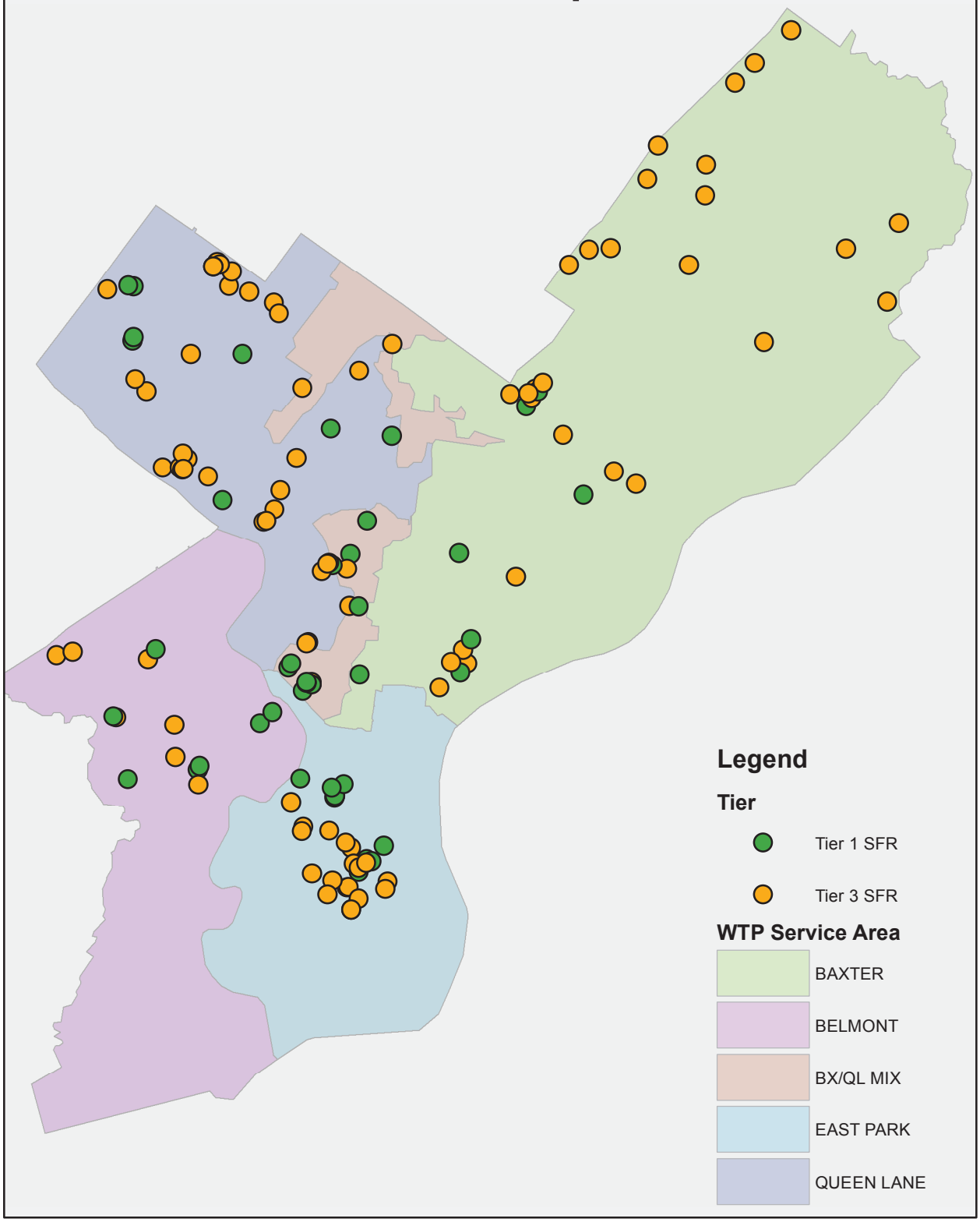
PWD Lead and Copper Rule
All Participants - 1992 - 2014



PWD Lead and Copper Rule
All Participants - 1992 - 2014



PWD Lead and Copper Rule
2014 Participants



PWD Lead and Copper Rule
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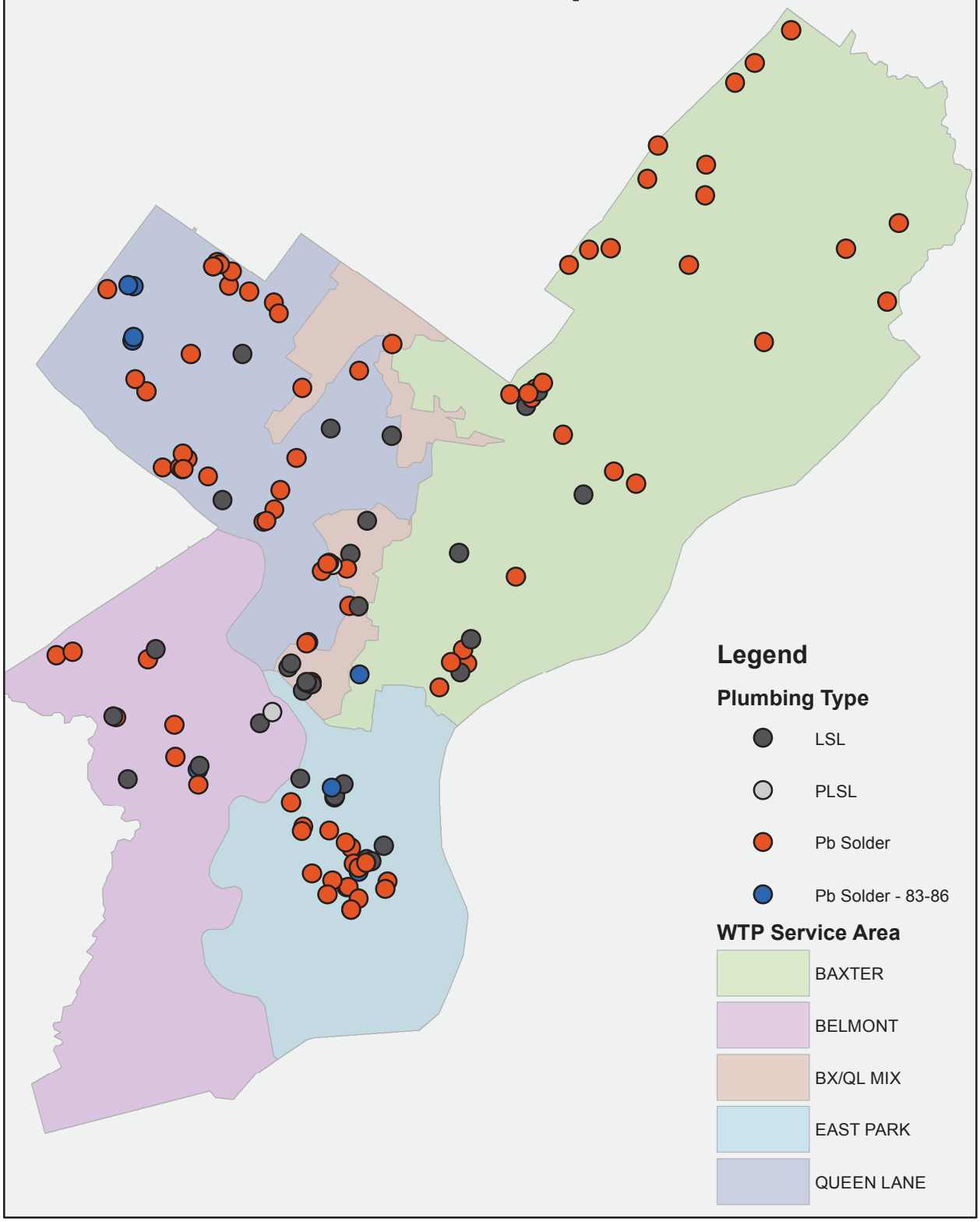

PWD Lead and Copper Rule 2014
OCCT and Entry Point Locations